**Computer Science and Engineering**

**Outcome Based Education**

**Course Outcome**

|  |  |  |  |
| --- | --- | --- | --- |
| Subject: | Software Engineering | Max Marks External | 75 Marks |
| Subject Code: | ETCS-303 | Max Marks Internal | 25 Marks |
| Total Credit: | 4 | **Evaluation Scheme** | |
| Contact Hours: | L 3 | Evaluation 75 Marks | End-term Exam |
| T 1 | Evaluation 25 Marks | Sessional Exam |

**Course Objective:**

The objective of this course is to understand the software perspectives and some software evaluation issues including project management. It also provides the knowledge for making good quality software by ensuring quality control so that we can apply it in the discipline of software engineering and its application to the development and management of software systems.

**Course Outcome:**

At the end of the course, a student will be able to:

**C303.1:** To understand how the software is created by using different software development life

cycle models.

**C303.2:** To calculate size and cost for software by using different estimation techniques.

**C303.3:** To develop a document based on software requirement by analyzing the requirement of

software and can show diagrammatically the process of software.

**C303.4:** To understand classification of cohesiveness and coupling and able to design diagrams

based on function oriented and object oriented approach.

**C303.5:** To learn how to apply different testing strategies on software applications.

**C303.6:** To learn how to maintain a software using different maintenance models and how

reliability of software can be achieved using reliability models.

**Program Outcomes**

**1.** **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**2. Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**8. Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**9. Individual and team work:** Function effectively as an individual, and as a member or leader indiverse teams, and in multidisciplinary settings.

**10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Mapping of CO with PO (Theory)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CO** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **%** |
| **C303.1** | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 88.88 |
| **C303.2** | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 91.66 |
| **C303.3** | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 86.11 |
| **C303.4** | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 86.11 |
| **C303.5** | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 88.88 |
| **C303.6** | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 86.11 |
| **Average** | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 87.95 |

Course coordinator: Ms. KarunaMiddha Module Coordinator: Mr. Yogesh Sharma

Mr. Saurabh Rastogi

**Program Specific Outcomes:**

**PSO 1: Professional Skills**

An ability to understand the basic concepts in Computer Science and Engineering and to apply them to various areas, like Algorithm and design, operating system, database, Networking, Compiler, Machine learning and to be mastered the latest techniques used in the field of research and industry.

**PSO 2: Problem Solving Skills**

An ability to solve various problems in the area of Computer Science and Engineering using latest hardware and software tools.

**PSO 3: Successful Career**

An understanding of social –awareness &environment-wisdom along with ethical responsibility to help achieve a successful career and to sustain passion and zeal for real world application using optimal resources as an Entrepreneur**.**

**Mapping of Course outcome with Program specific outcomes:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CO** | **PSO1** | **PSO2** | **PSO3** | **%** |
| **C303.1** | **3** | **3** | **2** | **88.88** |
| **C303.2** | **3** | **3** | **2** | **88.88** |
| **C303.3** | **3** | **3** | **2** | **88.88** |
| **C303.4** | **3** | **2** | **2** | **77.77** |
| **C303.5** | **2** | **3** | **3** | **88.88** |
| **C303.6** | **2** | **2** | **3** | **77.77** |
| **Average** | **3** | **3** | **2** | **85.17** |

Course coordinator: Ms. KarunaMiddha Module Coordinator: Mr. Yogesh Sharma

Mr. Saurabh Rastogi

**Program Educational Objective:**

**PEO1**: To train students to have successful careers in computer engineering field or to be able to successfully pursue advanced degrees.

**PEO2**: To imbibe in students an ability to provide solutions to challenging problems in their profession by applying computer Engineering principles.

**PEO3**: Train students to communicate effectively, work collaboratively and exhibit high levels of professionalism and ethical responsibility.

**PEO4**: To motivate graduates to engage in life-long learning and professional development to adapt to rapidly changing work environment.

**Mapping of Course outcome with PEO:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CO** | **PEO1** | **PEO2** | **PEO3** | **PEO4** | **%** |
| **C303.1** | **3** | **2** | **2** | **3** | **83.33** |
| **C303.2** | **3** | **2** | **3** | **3** | **91.66** |
| **C303.3** | **3** | **3** | **2** | **2** | **83.33** |
| **C303.4** | **2** | **2** | **3** | **3** | **83.33** |
| **C303.5** | **3** | **2** | **3** | **2** | **83.33** |
| **C303.6** | **2** | **3** | **3** | **3** | **91.66** |
| **Average** | **3** | **2** | **3** | **3** | **86.11** |

Course coordinator: Ms. KarunaMiddha Module Coordinator: Mr. Yogesh Sharma

Mr. Saurabh Rastogi